

Abstract

A charged particle beam system uses an ion generator for charge neutralization. In some embodiments, the ion generator is configured to maintain an adequate gas pressure at the ion generator to generate ions, but a reduced pressure in the remainder of the vacuum chamber, so that another column can operate in the chamber either simultaneously or after an evacuation process that is much shorter than a process that would be required to evacuate the chamber from the full pressure required at the ion generator. The invention is particularly useful for repair of photolithography masks in a dual beam system.